

**National EPA-Tribal Science Council (TSC)
Conference Call Roll Call and Key Discussion Points
Monday, February 22, 2021
2:00–3:30 p.m. EST**

Roll Call

Tribal Caucus

- ___ Region 1: William (Billy) Longfellow
(Passamaquoddy at Sipayik)
- ___ Region 1 *Alternate*: Trevor White
(Passamaquoddy Tribe of Indian Township)
- ✓ Region 2: Neil Patterson Jr. (Tuscarora Nation),
Chair
- ___ Region 3: Vacant
- ✓ Region 4: Katie Tiger (Eastern Band of
Cherokee Indians)
- ___ Region 4 *Alternate*: Jerry Cain (Mississippi
Band of Choctaw Indians)
- ___ Region 5: Scott Walz (Shakopee Mdewakanton
Sioux Community)
- ___ Region 6: Craig Kreman (Quapaw Tribe)
- ___ Region 6 *Alternate*: Vacant
- ✓ Region 7: Page Hingst (Santee Sioux Nation of
Nebraska)
- ✓ Region 7 *Alternate*: Misha Mazurkewycz (Ponca
Tribe of Nebraska)
- ✓ Region 8: Joshua Tweeton (Spirit Lake Tribe)
- ___ Region 8 *Alternate*: Allyson Two Bears
(Standing Rock Sioux Tribe)
- ✓ Region 9: Shasta Gaughen (Pala Band of
Mission Indians)
- ___ Region 9 *Alternate*: Crystal Robinson (Quartz
Valley Indian Reservation)
- ___ Region 10: Lee Juan Tyler (Shoshone-Bannock
Tribes)
- ___ Region 10 *Alternate*: Kelly Wright (Shoshone-
Bannock Tribes)
- ___ Region 10 (Alaska): Vacant

EPA Caucus

- ___ Region 1: Vacant
- ✓ Region 2: Kai Tang
- ✓ Region 3: Regina Poeske
- ✓ Region 4: Dawn Taylor
- ✓ Region 5: Janette Marsh
- ✓ Region 5 *Alternate*: Mari Nord
- ✓ Region 6: Alexandra (Alexa) Olson
- ✓ Region 7: Christopher (Chris) Taylor
- ✓ Region 8: Monia Ben-Khaled
- ___ Region 8: Justin Bleiler
- ✓ Region 9: Rebecca Jamison
- ✓ Region 9 *Alternate*: Danielle Huang
- ✓ Region 10: Lon Kissinger
- ✓ AIEO: Francine St. Denis
- ___ OAR: Amanda Kaufman
- ___ OCHP: Ted Coopwood
- ✓ OCSPP: Karen Hamernik
- ___ OCSPP *Alternate*: Amanda Hauff
- ✓ OLEM: David Charters
- ✓ OMS: Beth Jackson
- ✓ ORD: José Zambrana, Liaison
- ✓ ORD: Brenda Rashleigh, Chair
- ✓ OW: Nate Delano

Support Personnel and Invited Guests

- ✓ Monica Rodia, TSC Executive Secretary
- ✓ Valerie Blank, EPA ORD OSAPE
- ✓ Ryan Bonney, Shakopee Mdewakanton Sioux
Community
- ✓ Hari Karne, EPA ORD/ORAU Student
Contractor
- ✓ Kristen LeBaron, Support Contractor (SCG)

Action Items

1. TSC members will read the monthly teleconference minutes to ensure that they are aware of current activities, news and action items.
2. TSC members interested in serving on the Agenda Development Team for the TSC Spring 2020 Virtual Science Meeting will contact Monica Rodia.

Key Discussion Points

Roll Call and Distribution of Meeting Minutes

- Monica Rodia took the roll and explained that the TSC January monthly call minutes had been finalized and distributed.
- TSC members should read the minutes each month to ensure that they are aware of current activities, news and action items.

Caucus Report Outs

- Neil Patterson reported that the recent Tribal Caucus call had been short, with members discussing potential conflicts with the TSC Spring 2020 Virtual Science Meeting in May. The National Tribal Air Forum is being held May 17–20, and the National Indian Health Board is meeting May 17–21.
- Brenda Rashleigh reported that during its meeting, the EPA Caucus had discussed JoAnn Chases appointment as the new director of EPA's American Indian Environmental Office, the National Tribal Caucus' effort to meet with the chairs of the EPA-Tribal Partnership Groups, how the TSC can help the Office of Research and Development (ORD) incorporate tribal science needs and priorities into its Strategic Research Action Plans, obtaining guidance on how to work with tribes on a scientific level, and potential dates for the upcoming TSC Spring 2020 Virtual Science Meeting. José Zambrana added that ORD has been holding listening sessions to provide input on the office's wildland fire research framework, including two tribal listening sessions. Engagement was robust, with representatives from 22 tribes and tribal organizations attending the first session, and 32 attending the second. The next step is to implement the feedback into ORD's wildland fire research and hold a webinar describing this implementation.

Innovations in Natural Resources Through GIS and Drone-Aided Remote Sensing, Ryan Bonney, Shakopee Mdewakanton Sioux Community (SMSC)

- Ryan Bonney described unmanned aerial vehicle (UAV) advancements in field work, as use of UAVs in field operations has grown dramatically. Many industries are eager to identify and establish uses for UAVs in their domains, and the relative low cost of operations has helped to fuel this boom.
- UAVs can operate in environments and locations that would be unsafe for personnel. UAVs are popularly used for precision agriculture to optimize crop yield and prevent over fertilization and watering and in construction and mining for building inspections and ore volume monitoring.
- The SMSC Land Department has utilized UAVs in more than 100 missions since the fall of 2016 for mapping, video production, planning, environmental management and water resource management; novel uses are developing rapidly (e.g., counting migratory waterfowl).
- The department uses supervised classification to classify images. Representative samples ("training sets") are selected for each land-cover class, and the software applies these training sets to the entire image for classification.
- Ryan showed UAV images from some innovative remote sensing projects that the SMSC Land Department is undertaking with the use of drones, including the following:
 - *Environmental analysis of buckthorn.* Using multispectral classification systems and trained field identification, the department is able to highlight pixels that likely represent buckthorn.

- *Wild rice investigation.* SMSC assisted the Prairie Island Indian Community with an aerial assessment of wild rice beds using supervised classification to determine the distribution of wild rice in difficult-to-reach locations.
- Using top-down imagery, the department can apply advanced photogrammetry techniques to make orthomosaic maps with excellent detail. The same imagery can be used to produce high-resolution digital elevation models. This allows 3D infrastructure models of objects to be developed. A high-detail 3D model may be used in planning new developments.
- The orthomosaic maps also are available in multispectral format; multispectral imagery breaks light into its composite forms. These multispectral images can be rearranged to highlight different bandwidths to make otherwise innocuous objects more apparent.
- Ryan showed examples of orthomosaic images, digital elevation models and 3D models for several locations on SMSC land.
- The SMSC Land Department also uses the UAV for photography purposes. Ryan displayed several spectacular photographic images.
- To get started with this technology, it is necessary to purchase a drone, camera and appropriate accessories. Drones and cameras can cost from hundreds to tens of thousands of dollars, depending on quality. Drone-mounted LiDAR systems cost \$50,000 to \$80,000.
- Ryan may be contacted at ryan.bonney@shakopeedakota.org for further information.
- Shasta Gaughen explained that her tribe has received grant funding to obtain a drone, and she asked how long it takes to become skilled at using the drone. Ryan replied that he studied for 2 weeks through one of the many online training programs to become a Federal Aviation Administration–certified drone pilot. Modern drones fly themselves. Ryan noted that it is possible to use software, such as DroneDeploy or Pix4D, to cloud-process the captured images, although he manually processes his images using Agisoft Metashape so that he has more control over the process. It is possible to start a drone program with \$5,000 and willing staff.
- Shasta asked whether the SPSC’s use of LiDAR had revealed any cultural sites. Ryan responded that these data are closely guarded by the tribe, but remote sensing and GIS have provided insight into cultural sites. He has created interactive cultural maps for the tribe. The tribe plans to use remote sensing during the summer to confirm the site of suspected burial mounds.
- Karen Hamernik asked how the tribe deals with privacy issues. Ryan answered that the tribe’s privacy operating procedures do not allow drones to be flown directly over individuals who are not involved in the project and require that drone operators notify property owners if a drone is going to be flown over their property. The drones fly at a height of 200 to 300 feet and cannot provide details about the inside of buildings.
- Karen asked whether the tribe had been able to detect chemical contaminant signatures in water or on land. Ryan responded that he had not identified contaminants with drones, but he has used satellite imagery combined with field-collected data to create an algorithm that could identify the approximate water clarity of Mille Lacs Lake in Minnesota. This lake has a problem with an invasive species—zebra mussels—and the algorithm could help identify the location of mussel beds. The University of Minnesota is working on similar projects.
- Lon Kissinger commented that some projects are using spectral imagery to address harmful algal blooms, and he asked whether Ryan had performed any work in this area. Ryan replied that he has not done this

yet, but he has designed criteria for when the tribe begins projects in this area. Large lakes have logistical issues related to flight time and training sets.

TSC Spring 2021 Virtual Science Meeting

- The meeting is being planned for 3 consecutive afternoons in May, avoiding the weeks of May 3 and 17.
- Volunteers are needed to serve on the Agenda Development Team; José volunteered.

Announcements

- The U.S. Department of the Interior has announced that it will hold a series of tribal consultations in response to President Biden's Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships. More information can be found at www.doi.gov/pressreleases/interior-announces-series-tribal-consultations-recognition-importance-nation-nation.

Next conference call: March 15, 2:00–3:30 p.m. EDT